diuretin, agurin and paraxanthin, may be tried; for unfortunately we can not reason that because one has failed another will do the same. Perhaps no part of therapeutics is more full of surprises than is this of the practical use of diuretics. In theophyllin, however, we possess one of the most reliable drugs of this field.

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Discussion.

Dr. J. B. Frankenheimer, San Francisco: I have tried this drug in several cases at the suggestion of Dr. Hewlett, and have found it very successful. We have had astonishing results with it.

Dr. R. L. Porter, San Francisco: I have not had any personal experience with it, but have seen it used by Dr. Shiels, of San Francisco. He says in giving theophyllin it is always necessary to give a mercurial compound. There is a question of diuretics in acute nephritis. The use of caffein has been tried and the use of diuretin, and both abandoned because by the use of a hot pack properly given and endoclysis, such good results have followed.

Dr. E. W. Twitchell, Sacramento: It seems to me that we have heard too little about the reverse side of this question. I have tried this drug on a number of my patients. There is no question about the diuretic effects, but the extreme effects were such that I abandoned its use. The patients almost invariably complain of severe nausea and vomiting. I have tried to overcome it, and have tested my patients by administering it in one form or another, but it almost always produced persistent nausea and it became necessary to abandon it.

Dr. L. J. Belknap, San Jose: I have never had any particular experience with this particular drug, but have had to do with a good many cases of cardiac dropsy, and as a rule I have met with good success by the use of the packs, and especially the electric light bath with friction salt to keep the skin active and if possible to do something in a curative way, rather than something only to remove the symptom. I have cleared up the trouble in this way, and it has remained so. I find it to advantage to keep these patients in bed, on milk diet, especially buttermilk, and by use of such treatments and keeping up the tonic treatments, I have had good success. I think we are liable to give treatments of a depressive nature of too great severity and too long continued.

Dr. W. W. Kerr, San Francisco: I think it is hardly fair to mix up the subject of this paper with that of dropsy in general. I do not think Dr. Hewlett said anything about rdopsy in general. He spoke merely of one drug and of those drugs of the group. Certain cases of dropsy are suitable to the bath treatments and certain others to other different treatments. The only trouble I have had with this drug has been the intense nervous excitement produced in some patients. Some patients can take but comparatively small doses. The same thing is noticed in caffein. I have seen one grain of caffein set a patient up for the whole day. I remember giving three grains to another patient with but slight excitement. There is one point about which I wish we knew something more, and that is the relation between the drug as it is given in the hypodermic form (there are a good many experiments being done on animals), and when given by the stomach and the different sorts used. For years I have noticed that the caffein would produce a good deal of trouble in the stomach. On the other hand, hypodermically, that was not produced. Whether it is the proportion given by the stomach which undergoes certain charges when given in the form of citrate, or whether it is the alkaloid that is affected, I do not know. In some cases the citrate of caffein increased the albuminuria, while hypodermically it did not have that effect.

Dr. W. E. Bates, Davisville: I have used this extensively and have now a patient with mitral insufficiency who is taking six doses a day of the theosin acetate. I would like to ask what mixture Dr. Hewlett uses in the liquid form.

Dr. Hewlett, closing discussion: The main remarks that have been made seem to be about the disagreeable features. A drug able to produce such marked effects is worthy of trial, and it is worth our while to get rid of the accessory symptoms. I think I covered the points in my paper more or less in regard to the gastric disturbances. Some patients can not take it. The gastric distress also is less if given in a solution rather than in powder form. It dissolves very readily and can be given with some form of peppermint in water. If a patient becomes delirious, then more must not be given of the drug. The drug can be given in much smaller doses. The most serious objection is that some patients have convulsions and some authors think the patients die in these convulsions, but I went over the history of such a case, and do not think the drug was the cause of the convulsions. If you wish to be cautious you should administer smaller doses, 1 to 3 grains t. i. d., or combine it with chloral, a drug which controls the central nervous system.

GROCCO'S SIGN.*

By JULE B. FRANKENHEIMER, M. D., San Francisco.

Notwithstanding the efforts of the best observers of clinical phenomena in the past, it has fallen to the lot of Grocco of Florence to note and describe a new and very valuable physical sign of pleural effusion. It is rather astonishing that such an obvious sign should have been overlooked so long, and, aside from its worth, it shows that there is still room for discovery by the pure clinician, and fur-

*Read at the Thirty-seventh annual meeting of the State Society, Del Monte, April, 1907.

nishes a stimulus for further effort in clinical observation.

We quote the brief description of "Grocco's triangle" in his own words from the excellent paper of Thayer and Fayban (1).

"Paravertebral tangle of the side opposite that of the pleural effusion. When, with a pleural effusion of sufficient size, one percusses from above downward, along the spinous processes of the vertebrae, with the patient in the sitting posture, there appears at the level of the fluid a dullness which, relative at first, becomes absolute as one passes downward, in association with a progressively increasing sense of resistance. In like manner, by percussing downward on the healthy side, along lines parallel to the spinous processes, there is noted, opposite the dullness in the median line, a paravertebral area of deficient resonance, of triangular shape. One side of this dull area is represented by the line of the spinous process; another, by the lower border of the area of thoracic resonance for a short distance which varies in length from two to three or more centimeters; the outer side is represented by a line which, starting from the base, rises obliquely to unite at an acute angle with the median line at about the upper limit of dullness. In a right-sided effusion, other things being equal, the paravertebral triangle has seemed to me more marked. Although symptomatology abounds in methods for differential diagnosis between pleural effusion and pulmonary infiltration, there can be no doubt that the sign which I have mentioned may be of value in some cases, especially in right-sided and encapsulated exudates. I shall return to this subject later with a detailed description which may illustrate that which, if I be not mistaken, is a diagnostic sign of pleural effusions hitherto undescribed and worthy of consideration."

Though Grocco's publication in March, 1902, was the first on the subject, there are at least two observers—Koranyi (2) and Rauchfuss (3) who were at that time acquainted with the sign. The latter claims cognizance of the phenomenon, which he obtained in children, for twenty years. With very few exceptions, clinicians have agreed that the sign is practically constant, and of diagnostic value.

Baduel and Siciliano, in a series of experiments on the cadaver, have reproduced, as nearly as possible, the conditions obtaining during the life of a patient with pleural effusion. They found that the "paravertebral triangle" was caused by a displacement of the contents of the mediastinum, the aorta, azygos vein, esophagus and the heart, to the side opposite to that containing the fluid. They explain the phenomenon, *i. e.*, the paravertebral triangle of dullness, by assuming that in every case of pleural effusion, where enough fluid is present, this displacement, due to increased intrathoracic pressure, occurs. Also, that the normal resonant note obtained by percussing the vertebrae is dulled by the fluid which occupies the place of a portion of one lung, and also extends in front of the bodies of the vertebrae, thus inhibiting their vibratory capabilities.

We see, then, that there are two factors to consider; first, the deadening influence of the fluid on the vibrations of the vertebrae; second, the displacement of the mediastinal structures with some slight compression of the lung on the unaffected side, which can be nicely demonstrated by the X-ray.

The method of obtaining the triangle is simple and hardly needs description; the examination, however, should not end with the outlining of the triangle, but should also consist in the usual measures of palpation and ausculation. On palpation the vocal fremitus is found diminished or absent, and, at times, this is so marked that the triangle may be outlined by this method alone. The ausculatory findings are, diminished breath sounds heard over the triangle, while occasionally, just outside the lower part of the hypotheneuse a few fine moist rales, due to compression of the lung, may be heard, as was noted by Plessi. Over the triangles due to larger effusions, egophany and the coin sound may be present and distinct.

Change of position of the patient with consequent disappearance and reappearance of the triangle, is of considerable importance. It appears to us that collections of pus in the pleura should cause a larger triangle than serous effusions, other things being equal; we have had too few cases, however, to draw any definite conclusions on this point.

To become acquainted with the sign and test its value, many cases of pleural effusion, and hydrothorax were examined, but on reviewing the histories only twenty-six cases are found. As experience was gained, not only were the dimensions of the triangle investigated, but also the amount of the vocal fremitus over it, the quality of the breath sounds, the character of the voice sounds, and the behavior of the triangle on change of position. Exploratory puncture was practiced in every case. There can be no doubt that in a vast majority of the cases the paravertebral triangle of Grocco is present; in fact, it is so constant that detailed histories of the patients would be wearisome, hence, short notes of the triangle only will be given. As control cases we have had several cases of pneumonia, one of abscess of the lung, and one of gangrene of the lung, in all of which Grocco's sign was absent. Of particular interest was a case of encapsulated empyema on the left side. There was an area of flatness from the fifth rib to the base, and from the mid axillary line almost to the spinal column; the intervening strip being somewhat dull. There was no paravertebral triangle present; puncture yielded a small amount of thick pus.

Case I.—P. C. Diagnosis: Bronchitis, pleurisy with effusion. Right side of chest moves more than left. Dullness of left side posteriorily from seventh dorsal down. Vocal fremitus absent over this area. No friction. On the right side there is a triangular area of dullness the apex of which is at the eighth dorsal, the base extending 3 cm. to the right of the spine. Exploratory puncture in seventh interspace (left) gives clear fluid.

Case II.—W. S. Diagnosis: Pneumonia (?), empyema. Dullness on right side from fifth dorsal down. Vocal fremitus much diminished over dull

area. Bronchial breathing present, though distant. On the left side there is a triangular area of dullness commencing at the lower sixth dorsal extending downward and outward till at the base it has a breadth of 7 cm. Aspiration yielded 1250 cc. of greenish pus. Operation.

Case III.—J. T. Diagnosis: Pleurisy with effusion. Tuberculous involvement of upper lobes. On the right side there is dullness from the ninth dorsal down. A triangular area of dullness on the left side is found commencing at the tenth dorsal, the width at the base being 3 cm. A needle was introduced into right back and fluid obtained. Autopsy showed fluid on both sides, more on right.

Case IV.—W. W. Diagnosis: Bronchitis. Pleurisy with effusion. Dullness on left side begins at the seventh dorsal and continues to base. On the right side the triangle begins at the eighth dorsal and has a base of 3½ cm. Vocal fremitus in the triangle is diminished but not entirely absent. Exploratory puncture in left scapular line yields fluid.

Case V.—G. S. Diagnosis: Acute dilatation of right heart, general edema, pleural transudate, chronic passive congestion of kidneys. Dullness of right side from fifth dorsal down. Vocal fremitus diminished over this area. On the left side paravertebral triangle commences at lower sixth dorsal and has a base of 3½ cm. Breath sounds over dull area hardly perceptible. Vocal fremitus diminished A needle introduced into right back and fluid obtained.

Case VI.—H. H. Diagnosis: Pleurisy with effusion. Dullness of left side from seventh dorsal down. Apex of paravertebral triangle on right side is at the eighth dorsal while its base extends 4 cm. from the mid-line. Vocal fremitus over triangle slightly decreased. When patient lies on affected side the triangle disappears in one minute. Vocal fremitus in this position does not entirely return; 800 cc. aspirated from left back.

Case VII.—J. S. Diagnosis: Pleurisy with effusion. Dullness of right back from fourth, flatness from sixth dorsal down. Vocal fremitus diminished over dull area, absent over flat. Paravertebral triangle commences at sixth dorsal and has a base of 4 cm. Vocal fremitus and breath sounds diminished over this area. The triangle disappears after the lapse of two or three minutes when patient lies on affected side. Fluid obtained by puncture.

Case VIII.—D. F. Diagnosis: Pleurisy with effusion. Dullness of right back at fourth dorsal, flatness at lower fifth. Paravertebral triangle commences at the sixth dorsal and has a base of 6½ cm. Vocal and breath sounds diminished over this area. Triangular dullness disappears when patient lies on affected side; 500 cc. removed from right pleura.

Case IX.—G. C. Diagnosis: Pneumonia of right lower lobe with pleuritic effusion. Dullness of right side from fifth dorsal down. Over this area vocal fremitus diminished and absent. Bronchial breathing. Paravertebral triangle on the left side commencing at the sixth dorsal; the base is 6 cm. Over this area vocal fremitus and breath sounds slightly diminished. When patient lies on affected side, triangle disappears. The needle yields a rather purulent fluid.

Case X.—M. C. Diagnosis: Pleurisy with effusion. Dullness of right side from ninth dorsal down. Over this area vocal fremitus diminished and breath sounds distant. Pleuritic friction heard in right lower anterior chest. On the left side there is a paravertebral triangle the apex of which it at the tenth dorsal, the base being 3 cm. Dullness rapidly diminishes when patient lies on affected side. Fremitus not diminished over triangle. Exploratory puncture right side yields a few drops of pus.

Case XI.—L. W. Diagnosis: Disseminated tuberculosis; pleurisy with effusion. Dullness on the left side from the eighth dorsal down. Semi-lunar space of Traube dull. Vocal fremitus decreased and absent over this area. Paravertebral triangle found on right side commencing at ninth dorsal; the base measures 4 cm. Vocal fremitus somewhat diminished. Breath sounds not so distant over this area. Puncture yields fluid. Tubercle bacilli found in sputum.

Case XII.—O. T. Diagnosis: Pneumonia; pleural effusion. Dullness on right side commencing at sixth dorsal and extends downward. Vocal fremitus diminished over dull area but not entirely absent. Paravertebral triangle; apex at the seventh dorsal left, base 4½ cm. Vocal fremitus somewhat diminished over triangle, also breath sounds Change of position causes triangle to disappear. Exploratory puncture yields syringe full of blood-stained fluid.

Case XIII.—J. G. Diagnosis: Pleurisy with effusion. Dullness on the right side from the fifth dorsal down. Flatness commences at seventh dorsal. Paravertebral triangle on left side. Apex at the upper seventh dorsal. Vertical measurement 14 cm., base 4½ cm. Vocal fremitus much decreased over this area. The lower portion of which can be delmited by palpation alone. Nasal voice sounds heard over the triangle. When patient lies on affected side triangle disappears. Removal of 350 cc. fluid causes apex of triangle to descend 3.5 cm.

Case XIV.—C. Y. Diagnosis: Cardio-nephritic hydrothorax. Dullness on both sides from seventh dorsal down. Vocal fremitus practically absent over these areas. Needle introduced as low as possible on left side. Tenth interspace, and 850 cc. of fluid removed. Immediate examination shows a Grocco on left side, the apex of the triangle being at the eighth dorsal, the base measuring 4½ cm., the height being 11 cm. The vocal fremitus over this area is nearly absent and the breath sounds distant; outside and sharply limited by the hypotheneuse of the triangle there is a marked vocal fremitus. Dullness over the triangle disappears when patient lies on right side.

Case XV.—J. B. Diagnosis: Cardiac hydrothorax. Dullness from sixth dorsal down on right side. Vocal fremitus over this area almost absent. Over the left side, paravertebral triangle is present with its apex at the seventh dorsal, its base measures 7 cm., height 14 cm. Breath sounds over right side very distant, on left side, well marked. Over the triangle breath sounds diminished, as is also vocal fremitus. When patient lies on right side triangle area of dullness clears to quite an extent. Needle yields fluid.

Case XVI.—C. C. Diagnosis: Cardiac hydrothorax. Dullness on left side from seventh dorsal down, on right from lower eighth. Over dull areas vocal fremitus is absent and breath sounds distant. A small Grocco on the right side whose apex is just below the level of dullness on the left side, its base (2 cm.) is formed by the upper limit of dullness on the right side. As fluid is removed the triangle becomes more distinct and larger. After 1350 cc. of fluid have been removed from tenth interspace right we find the base to be 3 cm.

Examination on the day following shows: Dullness on the left side from upper eighth dorsal downward. Vocal fremitus over this area greatly diminished. Triangle on the right side has its apex at the lower eighth dorsal; the base measures 4 cm. the height 11 cm. Vocal fremitus and breath sounds diminished over this area. The voice sounds are the same as those over the effusion (slight egophany). After about three minutes with patient on left side, the triangle area clears but does not disappear completely.

Case XVII.—Wm. C. Diagnosis: Cardia-nephri-

tic hydrothorax. Dullness on right side from lower fifth dorsal down, on left from ninth dorsal down. Vocal fremitus diminished over dull area, especially left base. Breath sounds quite distinct and tubular with moist rales over right side; distant over left base. The apex of the Grocco triangle is at the sixth dorsal; the base at the level of dullness at the ninth dorsal is 4 cm. The hypotheneuse of the triangle continued downward forms a quadrilateral of which the dullness at the ninth dorsal forms the top, the base the bottom; the sides being formed by the spinal column and a segment of the hypotheneuse. Over the triangle proper vocal fremitus and breath sounds are diminished; in the quadrilateral above described, they are quite distant. Egophany is present. The triangle does not disappear when patient lies on right side. Fluid obtained by needle.

Case XVIII.—W. H. Diagnosis: Pneumonia, pleurisy with effusion. Patient entered hospital with involvement of left upper lobe, the left lower then became affected and later the right middle and lower. As the disease progressed the tissues earliest affected cleared up. At the time of the effusion the left lower lung was quite resonant. Dullness on right side at fifth dorsal, flatness at seventh dorsal. Apex of triangle is at seventh dorsal; the base measures 4 cm. Vocal fremitus is diminished over this area. The triangle disappears when patient lies on right side; 30 cc. greenish turbid fluid removed, examination of which shows 7200 white cells to the cmm., of which 95% were polynuclears, 3% large mononuclears and 2% lymphocytes.

Case XIX.—C. M. Diagnosis: Mitral insufficiency. Hydrothorax. Dullness on the right side from the eighth dorsal down, on the left from the tenth dorsal down. Vocal fremitus and breath sounds not diminished over upper portion of dullness, but from the tenth dorsal both sides it is almost absent. The apex of the paravertebral triangle is at the lower eighth, the base measures 2.5 cm. at the level of fluid tenth dorsal on the left side. Neither vocal fremitus or breath sounds diminished the triangle, which does not clear up when the patient lies on his right side; in fact the dullness increases, probably due to fluid on the left side. Puncture in the eighth interspace, scapular line, yields a clear fluid.

Case XX.—C. J. Diagnosis: Pleurisy with effusion. Dullness on the right side from lower fifth dorsal downward. Over this area vocal fremitus absent, breath sounds distant. On the left side the paravertebral triangle is at the seventh dorsal; the base measures 6½ cm. Vocal fremitus and breath sounds diminished over this area. When patient lies on right side the triangle becomes very much smaller but does not entirely disappear. Puncture yields clear fluid.

Case XXI.—F. G. Diagnosis: Empyema. Dullness on the left side from seventh dorsal down. Vocal fremitus diminished, distant bronchial breathing. The apex of the paravertebral triangle is at the eighth dorsal on the right; the base measures 3 cm. Vocal fremitus and breath sounds diminished over this area. Puncture yields 10 cc. thick greenish pus. Operation; recovery.

Case XXII.—T. S. Diagnosis. Pleurisy with effusion. Dullness of right side from eighth dorsal down Apex of paravertebral triangle on the left side is at lower eighth dorsal, the base measures 5 cm. Vocal fremitus diminished over triangle.

Case XXIII.—J. R. Diagnosis. Cardiac hydrothorax. Dullness of right back from lower sixth dorsal down. Vocal fremitus present. Breath sounds slightly diminished. Paravertebral triangle present on left side; the apex is at the seventh dorsal, the base at the tenth dorsal measures 4 cm. Small amount of fluid on the left. Triangle does not disappear when patient lies on right side. Puncture yields slightly cloudy fluid, 1300 cells per cmm.

Case XXIV.—J. S. Diagnosis: Pleurisy with effusion. Dullness on the right side from the lower sixth dorsal down. Vocal fremitus absent. Breath sounds distant over this area. Paravertebral triangle on the left side has its apex at the seventh dorsal vertebra; its base measures 5 cm. Over the triangular area vocal fremitus is diminished and breath sounds distant. Egophany present. Triangle disappears when patient lies on right side. Clear fluid obtained on exploratory puncture.

Case XXV.—R. W. Diagnosis: Pneumonia; pleurisy with effusion. Dullness on the right side from fifth dorsal down. Paravertebral triangle has its apex at the sixth dorsal; its base measures 5 cm. This area disappears when patient lies on affected side. Puncture yields clear fluid.

Case XXVI.—P. V. Diagnosis: Tuberculosis pulmonary; pleurisy with effusion. On left side dullness from eighth dorsal down. Apex of paravertebral triangle at the ninth on the left side; its base measures 3½ cm. Vocal fremitus diminished. Breath sounds distant over this area. Triangle disappears when patient lies on left side. Needle introduced into left interspace yields fluid.

Of particular interest are cases XIV, XVI and XVII. In case XIV, a double hydrothorax with dullness at the same level on both sides, the fluid was withdrawn from the lowest possible point, 10th interspace on the left side. Immediately afterward the paravertebral triangle was in evidence. In case XVI, also a double hydrothorax, the fluid was at different levels; from the 7th dorsal on the left side and from the lower 8th dorsal on the right. A small Grocco was present on the right side, the apex being just below the limit of dullness on the left. As the fluid was withdrawn from the right side, the triangle became more distinct, the apex remaining at the point determined before removal of the fluid. Case XVII was also a double hydrothorax. The fluid on the right side reached the 6th dorsal; on the left the 9th dorsal. A well marked paravertebral triangle could be outlined on the left with its base at the level of the fluid, 9th dorsal. Below this, a quadrilateral area, of absolute flatness, could be delimited. Its upper border was the level of the fluid, its lower, the base, the inner, the vertebral column and the outer a segment of the extended hypotheneuse of the triangle. Over this area vocal fremitus and breath are hardly appreciable, while egophany is present.

Conclusions:

1. Grocco's triangle was present in every one of our series of twenty-six cases of fluid in the pleura and absent in every control case.

2. The apex of the triangle is below the line of dullness and usually at, or slightly above, the line of flatness.

3. The base of the triangle may vary from two to eight centimeters; in this series, the extremes were three and seven centimeters.

4. Slight convexity of the hypotheneuse of the triangle which usually occurs above its middle, was noted in several cases; it is apparently found more frequently in the larger effusions. (We think this is due more to the displacement of the mediastinal

structures than to the deadening influence of fluid on the vertebral vibrations.)

5. Fluid in the right pleura causes a larger triangle than in the left—other things being equal.

6. The size of the triangle varies as the amount of fluid. This is shown by the daily variations in the height of the dullness, or by the removal of a portion of the fluid.

7. Only small quantities of fluid are necessary to cause the triangle when the lower lobe of the lung is consolidated.

8. Vocal fremitus is diminished or absent, and breath sounds distant over the triangular area. These signs in themselves will sometimes enable one to delimit the triangle.

9. Egophany when sought for, was heard over the triangle with more or less intensity in nearly all the cases of larger effusions, the larger the effusion the more intense the egophany. Unfortunately, the coin test was not made.

10. The disappearance of the triangle when the patient lies on the affected side, occurred in almost every case examined for this particular sign. The time of disappearance varies as the amount of fluid present; the smaller the amount, the quicker the resonant note returns.

11. The non-disappearance of a well marked triangle when the patient lies on the affected side, is due, either to an immense amount of fluid, or, the effusion may be encapsulated, or there is a small amount of fluid present on the apparently unaffected side which collects in the pleura next the vertebral column.

12. The triangle is of greater value in diagnosis when vocal fremitus is present on the affected side.

Since the above paper was read before the State Medical Society, ten more cases have been examined. The paravertebral triangle was found in all, and was of distinct diagnostic advantage in some of the cases.

(1) Am. Jour. Med. Soc., Jan., 1907. Complete bibliography up to date.
(2) Koranyi: Uber den Perkussionschool der Wirbelsoule und dessen diagnostische Verwertung. Nebst einer Berichtigung beguglich des pleuritischen (paravertebralen) Dreiecks. Zeitschrift fur Klin. Med. Vol. 60.
(3) Rauchfuss: Ueber die paravertebrale Dampfung auf der gesunden Brustsute bei Pleuraergussen. Deutsches Arch. Klin. Med. Vol. 89.

Discussion.

Dr. W. W. Kerr, San Francisco: There is one point which I have noticed and which is of considerable diagnostic value, and that is the disappearance while the patient lies on the affected side. It is frequent that we have old cases of pleurisy with thickened pleura where the effusion has been partially removed and the balance left for absorption. You know that there is still some fluid, but as the patient is changed from side to side and you find the persistence or the disappearance of the triangle, it keeps you posted on the fluid, whether it is diminishing or increasing, because the high line will often be persisting on account of the thickened pleura and you might not be sure whether the effusion was increasing or not. If the triangle persists and we find the dullness changed, then you know there is still an amount of fluid in the chest. On that account it is one of the best methods we have for differential diagnosis.

Dr. W. Voorsanger, San Francisco: I have not had very much experience with this sign, but I think we should all be very much interested. No doubt it has a good deal of value, but I think we should accept it as definite with some hesitancy. Personally, if I were in doubt about an effusion I would not care to rely upon this sign. I would prefer puncture. I would like to hear just how far satisfied the doctor is as to the diagnostic value. Of course my experience has been limited.

Dr. A. W. Hewlett, San Francisco: I think this sign can be elicited in most cases of pleural effusion without much difficulty. I think every sign we have adds one more fact toward making us certain as to the diagnosis. For that reason, if for no other, it is valuable. I think it is of a good deal of value. In some cases of consolidation, it has happened that it is difficult to distinguish a pneumonia from an effusion in the pleural cavity and then it is of value. If you find the dullness extending over to the opposite side with the disappearance, it makes us think of effusion. Of course the needle is the last resort in all cases.

Dr. R. L. Porter, San Francisco: I wish to call attention to the fact that literature contains a greater number of cases of the sclerotic pneumonias of children in which puncture has been tried fluid found and the child died subsequently. There is no question whatever that in comparing this triangle we are enabled very materially to determine whether there is an effusion or not. There is one condition in which you may be misled, in the so-called creeping pneumonias, if there is one densely consolidated lung and the edge of the other coming across it is impossible to differentiate.

Dr. F. M. Pottenger, Los Angeles: I have had no personal experience with this sign. But there is one thing to which I would like to call attention which I met just yesterday. I was examining a case very carefully where the left lung was markedly contracted and the right lung hypertrophied and I found this dullness. We know that very often the lung is pushed beyond the median line. In this case I found dullness beyond the median line. Between pneumonia and a case of effusion, we can diagnose by the auscultory method and make out the limitations and differentiate the liver dullness from the effusion.

Dr. J. B. Frankenheimer, closing discussion: It was in 1902 that Grocco first published his description of the triangle, though others have since claimed acquaintance with the triangle for 20 years. For the cause of the triangle, the two most important factors are the fluid in the chest dulling the vibrations of the veterbrae which act as pleximeters, and the pushing over of the mediastinal structures. It is rather difficult to explain without drawing. Referring to the cases of which Dr. Voorsanger spoke, I will say that in every one of the thirty reported, after diagnosing the fluid, we introduced the needle and obtained the fluid in every case but one, and in that case autopsy showed plenty of fluid there. We treat clinic cases in a more scientific manner than cases in private practice and so we resort to the needle which is quicker in hospital work than in private. Nevertheless, if we could diagnose as quickly with the triangle as with the needle it would be better. With regard to this idea of purulent effusion and larger triangle, I have not had enough experience. Dr. Pottenger's case is very interesting. The sign must not be taken in itself but from a general survey of the chest.